Title: IL-15 ANTAGONISTS Applicant(s): Dreher et al.

Filing Date: April 12, 2005 Serial No.: 10/530,987

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Figure 1 a: Amino acid sequence WT-IL-15-hIgG1:

NWVNVISDLKKTEDLIQSMHIDATLYTESDVHPSCKVTAMKCFLLELQVISLESG
DASIHDTVENLIILANNSLSSNGNVTESGCKECEELEEKNIKEFLQSFVHIVQMF
INTSDPKSADKTHTCPPCPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDV
SHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKC
KVSNKALPAPIEKTISKAKGQPREPQVYTLPPSRDELTKNQVSLTCLVKGFYPSD
IAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVMHEA
LHNHYTQKSLSLSPGK

(SEQ ID NO: 4)

Title: IL-15 ANTAGONISTS Applicant(s): Dreher et al.

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Figure 1 b:

Amino acid sequence WT-IL-15-mIgG2a:

NWVNVISDLKKTEDLIQSMHIDATLYTESDVHPSCKVTAMKCFLLELQVISLESG
DASIHDTVENLIILANNSLSSNGNVTESGCKECEELEEKNIKEFLQSFVHIVQMF
INTSDPRGPTIKPCPPCKCPAPNLLGGPSVFIFPPKIKDVLMISLSPIVTCVVVD
VSEDDPDVQISWFVNNVEVHTAQTQTHREDYNSTLRVVSALPIQHQDWMSGKEFK
CKVNNKDLPAPIERTISKPKGSVRAPQVYVLPPPEEEMTKKQVTLTCMVTDFMPE
DIYVEWTNNGKTELNYKNTEPVLDSDGSYFMYSKLRVEKKNWVERNSYSCSVVHE
GLHNHHTTKSFSRTPGK
(SEQ ID NO: 5)

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Figure 2 a: Amino acid sequence WT-IL-15:

NWVNVISDLKKIEDLIQSMHIDATLYTESDVHPSCKVTAMKCFLLELQVISLESG DASIHDTVENLIILANNSLSSNGNVTESGCKECEELEEKNIKEFLQSFVHIVQMF INTS (SEQ ID NO: 1)

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Figure 2 b:

Amino acid sequence hIgG1:

PKSADKTHTCPPCPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDP  ${\tt EVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNK}$ ALPAPIEKTISKAKGQPREPQVYTLPPSRDELTKNQVSLTCLVKGFYPSDIAVEW ESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVMHEALHNHY TQKSLSLSPGK

(SEQ ID NO: 2)

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Figure 2 c:

Amino acid sequence mIgG2a:

PRGPTIKPCPPCKCPAPNLLGGPSVFIFPPKIKDVLMISLSPIVTCVVVDVSEDD PDVQISWFVNNVEVHTAQTQTHREDYNSTLRVVSALPIQHQDWMSGKEFKCKVNN KDLPAPIERTISKPKGSVRAPQVYVLPPPEEEMTKKQVTLTCMVTDFMPEDIYVE WTNNGKTELNYKNTEPVLDSDGSYFMYSKLRVEKKNWVERNSYSCSVVHEGLHNH HTTKSFSRTPGK

(SEQ ID NO: 3)

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Figure 3 a: Amino acid sequence Igk8

NWVNVISDLKKIEDLIQSMHIDATLYTESDVHPSCKVTAMKCFLLELQVISLESG
DASIHDTVENLIILANNSLSSNGNVTESGCKECEELEEKNIKEFLDSFVHIVDMF
INTSDPRGPTIKPCPPCKCPAPNLLGGPSVFIFPPKIKDVLMISLSPIVTCVVVD
VSEDDPDVQISWFVNNVEVHTAQTQTHREDYNSTLRVVSALPIQHQDWMSGKEFK
CKVNNKDLPAPIERTISKPKGSVRAPQVYVLPPPEEEMTKKQVTLTCMVTDFMPE
DIYVEWTNNGKTELNYKNTEPVLDSDGSYFMYSKLRVEKKNWVERNSYSCSVVHE
GLHNHHTTKSFSRTPGK

(SEQ ID NO: 24)

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Figure 3 b:

Amino acid sequence 149-Fc

NWVNVISDLKKIEDLIQSMHIDATLYTESDVHPSCKVTAMKCFLLELQVISLESG
DASIHDTVENLIILANNSLSSNGNVTESGCKECEELEEKNIKEFLDSFVHIVQMF
INTSDPRGPTIKPCPPCKCPAPNLLGGPSVFIFPPKIKDVLMISLSPIVTCVVVD
VSEDDPDVQISWFVNNVEVHTAQTQTHREDYNSTLRVVSALPIQHQDWMSGKEFK
CKVNNKDLPAPIERTISKPKGSVRAPQVYVLPPPEEEMTKKQVTLTCMVTDFMPE
DIYVEWTNNGKTELNYKNTEPVLDSDGSYFMYSKLRVEKKNWVERNSYSCSVVHE
GLHNHHTTKSFSRTPGK

(SEQ ID NO: 25)

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Figure 4: Nucleic acid sequence WT-IL-15-hIgG1:

AACTGGGTGAATGTAATAAGTGATTTGAAAAAAACCGAAGATCTTATTCAATCTA TGCATATTGATGCTACTTTATATACGGAAAGTGATGTTCACCCCAGTTGCAAAGT AACAGCAATGAAGTGCTTTCTCTTGGAGTTACAAGTTATTTCACTTGAGTCCGGA GATGCAAGTATTCATGATACAGTAGAAAATCTGATCATCCTAGCAAACAACAGTT TGTCTTCTAATGGGAATGTAACAGAATCTGGATGCAAAGAATGTGAGGAACTGGA GGAAAAAATATTAAAGAATTTTTGCAGAGTTTTGTACATATTGTCCAAATGTTC ATCAACACTTCGGATCCCAAATCTGCTGACAAAACTCACACATGCCCACCGTGCC CAGCACCTGAACTCCTGGGGGGACCGTCAGTCTTCCTCTTCCCCCCAAAACCCAA AGCCACGAAGACCCTGAGGTCAAGTTCAACTGGTACGTGGACGGCGTGGAGGTGC ATAATGCCAAGACAAAGCCGCGGGAGGAGCAGTACAACAGCACGTACCGTGTGGT CAGCGTCCTCACCGTCCTGCACCAGGACTGGCTGAATGGCAAGGAGTACAAGTGC AAGGTCTCCAACAAAGCCCTCCCAGCCCCCATCGAGAAAACCATCTCCAAAGCCA AAGGGCAGCCCGAGAACCACAGGTGTACACCCTGCCCCCATCCCGGGATGAGCT GACCAAGAACCAGGTCAGCCTGACCTGCCTGGTCAAAGGCTTCTATCCCAGCGAC ATCGCCGTGGAGTGGGAGAGCAATGGGCAGCCGGAGAACAACTACAAGACCACGC CTCCCGTGCTGGACTCCGACGGCTCCTTCTTCCTCTACAGCAAGCTCACCGTGGA CAAGAGCAGGTGGCAGCAGGGGAACGTCTTCTCATGCTCCGTGATGCATGAGGCT CTGCACAACCACTACACGCAGAAGAGCCTCTCCCTGTCTCCGGGTAAATGATCTA GA

(SEQ ID NO: 9)

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Figure 5: Nucleic acid sequence WT-IL-15-mIgG2a:

AACTGGGTGAATGTAATAAGTGATTTGAAAAAAATTGAAGATCTTATTCAATCTA TGCATATTGATGCTACTTTATATACGGAAAGTGATGTTCACCCCAGTTGCAAAGT AACAGCAATGAAGTGCTTTCTCTTGGAGTTACAAGTTATTTCACTTGAGTCCGGA GATGCAAGTATCATGATACAGTAGAAAATCTGATCATCCTAGCAAACAACAGTT TGTCTTCTAATGGGAATGTAACAGAATCTGGATGCAAAGAATGTGAGGAACTGGA GGAAAAAATATTAAAGAATTTTTGCAGAGTTTTGTACATATTGTCCAAATGTTC ATCAACACTTCGGATCCCAGAGGGCCCACAATCAAGCCCTGTCCTCCATGCAAAT GCCCAGCACCTAACCTCTTGGGTGGACCATCCGTCTTCATCTTCCCTCCAAAGAT CAAGGATGTACTCATGATCTCCCTGAGCCCCATAGTCACATGTGTGGTGGTGGAT GTGAGCGAGGATGACCCAGATGTCCAGATCAGCTGGTTTGTGAACAACGTGGAAG TACACACAGCTCAGACACAAACCCATAGAGAGGATTACAACAGTACTCTCCGGGT GGTCAGTGCCCTCCCCATCCAGCACCAGGACTGGATGAGTGGCAAGGAGTTCAAA TGCAAGGTCAACAACAAGACCTCCCAGCGCCCATCGAGAGAACCATCTCAAAAC CCAAAGGGTCAGTAAGAGCTCCACAGGTATATGTCTTGCCTCCACCAGAAGAAGA GATGACTAAGAAACAGGTCACTCTGACCTGCATGGTCACAGACTTCATGCCTGAA GACATTTACGTGGAGTGGACCAACAACGGGAAAACAGAGCTAAACTACAAGAACA CTGAACCAGTCCTGGACTCTGATGGTTCTTACTTCATGTACAGCAAGCTGAGAGT GGAAAAGAACTGGGTGGAAAGAATAGCTACTCCTGTTCAGTGGTCCACGAG GGTCTGCACAATCACCACACGACTAAGAGCTTCTCCCGGACTCCGGGTAAATGAG (SEQ ID NO: 10)

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Figure 6 a:

Nucleic acid sequence WT-IL-15:

AACTGGGTGAATGTAATAAGTGATTTGAAAAAAATTGAAGATCTTATTCAATCTA
TGCATATTGATGCTACTTTATATACGGAAAGTGATGTTCACCCCAGTTGCAAAGT
AACAGCAATGAAGTGCTTTCTCTTTGGAGTTACAAGTTATTTCACTTGAGTCCGGA
GATGCAAGTATTCATGATACAGTAGAAAATCTGATCATCCTAGCAAACAACAGTT
TGTCTTCTAATGGGAATGTAACAGAATCTGGATGCAAAGAATGTGAGGAACTGGA
GGAAAAAAATATTAAAGAATTTTTGCAGAGTTTTGTACATATTGTCCAAATGTTC
ATCAACACTTC

(SEQ ID NO: 6)

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Figure 6 b:

Nucleic acid sequence hIgG1:

TGGGGGACCGTCAGTCTCCTCTTCCCCCAAAACCCAAGGACACCTGAACTCC
TGGGGGACCGTCAGTCTTCCTCTTCCCCCCAAAACCCAAGGACACCCTCATGAT
CTCCCGGACCCCTGAGGTCACGTGCGTGGTGGACGTGAGCCACGAAGACCCT
GAGGTCAAGTTCAACTGGTACGTGGACGGCGTGAGGTCATAATGCCAAGACAA
AGCCGCGGGAGGAGCAGTACAACAGCACGTACCGTGTGGTCAGCGTCCTCACCGT
CCTGCACCAGGACTGGCTGAATGGCAAGGAGTACAAGTGCAAGGTCTCCAACAAA
GCCCTCCCAGCCCCCATCGAGAAAACCATCTCCAAAAGCCAAAGGGCAGCCCCGAG
AACCACAGGTGTACACCCTGCCCCCATCCCGGGATGAGCTGACCAAGAACCAGGT
CAGCCTGACCTGGCCCCCATCCCAGCGACATCGCCGTGGAGTGG
GAGAGCAATGGGCAGCCGGAGAACAACTACAAGACCACGCCTCCCGTGCTGGACT
CCGACGGCTCCTTCTTCCTCTACAGCAAGCTCACCGTGGACAAGAGCAGGTGGCA
GCAGGGGAACGTCTTCTTCCTCTCATGCTCCGTGATGAGGCTCTCCCACAAACCACTAC
ACGCAGAAGAGCCTCTCCCTGTCTCCCGGGTAAATGAT

(SEQ ID NO: 7)

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Figure 7: Nucleic acid sequence mIgG2a:

CCCAGAGGCCCACAATCAAGCCCTGTCCTCCATGCAAATGCCCAGCACCTAACC
TCTTGGGTGGACCATCCGTCTTCATCTTCCCTCCAAAGATCAAGGATGTACTCAT
GATCTCCCTGAGCCCCATAGTCACATGTGTGGTGGTGGATGTGAGCGAGGATGAC
CCAGATGTCCAGATCAGCTGGTTTGTGAACAACGTGGAAGTACACACAGCTCAGA
CACAAACCCATAGAGAGGATTACAACAGTACTCTCCGGGTGGTCAGTGCCCTCCC
CATCCAGCACCAGGACTGGATGAGTGGCAAGGAGTTCAAATGCAAGGTCAACAAC
AAAGACCTCCCAGCGCCCATCGAGAGAACCATCTCAAAACCCAAAGGGTCAGTAA
GAGCTCCACAGGTATATGTCTTGCCTCCACCAGAAGAAGAGATGACTAAGAAACA
GGTCACTCTGACCTGCATGGTCACAGACTTCATGCCTGAAGACATTTACGTGGAG
ACTCTGACCACACAGGGAAAACAAGAGCTAAAACTACAAGAACATTTACGTGGAG
ACTCTGATGGTTCTTACTTCATGTACAGCAAGCTGAAGAGTGGAAAAAGAAGAACTG
GGTGGAAAGAAATAGCTACTCCTGTTCAGTGGTCCACGAGGGTCTGCACAATCAC
CACACGACTAAGAGCTTCTCCCGGACTCCGGGTAAATGAG
(SEQ ID NO: 8)

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Figure 8 a:

Nucleic acid sequence of murine IgK leader:

CTGGTGAC

(SEQ ID NO: 11)

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Figure 8 b: Nucleic acid sequence of human CD5 leader:

 $\tt ATGCCCATGGGGTCTCTGCAACCGCTGGCCACCTTGTACCTGCTGGGGATGCTGG$ 

TCGCTTCCTGCCTCGGA

(SEQ ID NO: 12)

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Figure 8 c:

Nucleic acid sequence of human CD4 leader:

 $\tt ATGAACCGGGGAGTCCCTTTTAGGCACTTGCTTCTGGTGCTGCAACTGGCGCTCC$ 

TCCCAGCAGCCACTCAGGGA

(SEQ ID NO: 13)

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Figure 8 d:

Nucleic acid sequence of human IL-2 leader:

 $\tt ATGTACAGGATGCAACTCCTGTCTTGCATTGCACTAAGTCTTGCACTTGTCACAA$ 

ACAGT

(SEQ ID NO: 14)

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Figure 9 a:

Nucleic acid sequence of human MCP leader:

 $\tt ATGAAAGTCTCTGCCGCCCTTCTGTGCCTGCTGCTCATAGCAGCCACCTTCATTC$ 

CCCAAGGGCTCGCT

(SEQ ID NO: 15)

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Figure 9 b:

Nucleic acid sequence of the short native human IL-15 leader:

 $\tt ATGTCTTCATTTTGGGCTGTTTCAGTGCAGGGCTTCCTAA$ 

(SEQ ID NO: 16)

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## Figure 9 c:

Nucleic acid sequence of the long native human IL-15 leader:

(SEQ ID NO: 17)

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Figure 10: Igk8 nucleic acid sequence

ATGGAGACAGACACTCCTGCTATGGGTACTGCTGCTCTGGGTTCCAGGTTCCA CTGGTGACAACTGGGTGAATGTAATAAGTGATTTGAAAAAATTGAAGATCTTAT TCAATCTATGCATATTGATGCTACTTTATATACGGAAAGTGATGTTCACCCCAGT TGCAAAGTAACAGCAATGAAGTGCTTTCTCTTTGGAGTTACAAGTTATTTCACTTG AGTCCGGAGATGCAAGTATTCATGATACAGTAGAAAATCTGATCATCCTAGCAAA CAACAGTTTGTCTTCTAATGGGAATGTAACAGAATCTGGATGCAAAGAATGTGAG GAACTGGAGGAAAAAATATTAAAGAATTTTTGGACAGTTTTGTACATATTGTCG ACATGTTCATCAACACTTCGGATCCCAGAGGGCCCACAATCAAGCCCTGTCCTCC ATGCAAATGCCCAGCACCTAACCTCTTGGGTGGACCATCCGTCTTCATCTTCCCT CCAAAGATCAAGGATGTACTCATGATCTCCCTGAGCCCCATAGTCACATGTGTGG TGGTGGATGTGAGCGAGGATGACCCAGATGTCCAGATCAGCTGGTTTGTGAACAA CGTGGAAGTACACACAGCTCAGACACAAACCCATAGAGAGGATTACAACAGTACT CTCCGGGTGGTCAGTGCCCTCCCCATCCAGCACCAGGACTGGATGAGTGGCAAGG AGTTCAAATGCAAGGTCAACAACAAGACCTCCCAGCGCCCATCGAGAGAACCAT CTCAAAACCCAAAGGGTCAGTAAGAGCTCCACAGGTATATGTCTTGCCTCCACCA GAAGAAGAGATGACTAAGAAACAGGTCACTCTGACCTGCATGGTCACAGACTTCA TGCCTGAAGACATTTACGTGGAGTGGACCAACAACGGGAAAACAGAGCTAAACTA CAAGAACACTGAACCAGTCCTGGACTCTGATGGTTCTTACTTCATGTACAGCAAG CTGAGAGTGGAAAAGAAGAACTGGGTGGAAAGAAATAGCTACTCCTGTTCAGTGG TCCACGAGGGTCTGCACAATCACCACACGACTAAGAGCTTCTCCCGGACTCCGGG TAAATGAG

(SEQ ID NO: 26)

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Figure 11: 149-Fc nucleic acid sequence

ATGGAGACAGACACTCCTGCTATGGGTACTGCTGCTCTGGGTTCCAGGTTCCA CTGGTGACAACTGGGTGAATGTAATAAGTGATTTGAAAAAATTGAAGATCTTAT TCAATCTATGCATATTGATGCTACTTTATATACGGAAAGTGATGTTCACCCCAGT TGCAAAGTAACAGCAATGAAGTGCTTTCTCTTTGGAGTTACAAGTTATTTCACTTG  ${\tt AGTCCGGAGATGCAAGTATTCATGATACAGTAGAAAATCTGATCATCCTAGCAAA}$ CAACAGTTTGTCTTAATGGGAATGTAACAGAATCTGGATGCAAAGAATGTGAG GAACTGGAGGAAAAAATATTAAAGAATTTTTGGACAGTTTTGTACATATTGTCC AAATGTTCATCAACACTTCGGATCCCAGAGGGCCCACAATCAAGCCCTGTCCTCC ATGCAAATGCCCAGCACCTAACCTCTTGGGTGGACCATCCGTCTTCATCTTCCCT CCAAAGATCAAGGATGTACTCATGATCTCCCTGAGCCCCATAGTCACATGTGTGG TGGTGGATGTGAGCGAGGATGACCCAGATGTCCAGATCAGCTGGTTTGTGAACAA CGTGGAAGTACACACACCTCAGACACAAACCCATAGAGAGGATTACAACAGTACT CTCCGGGTGGTCAGTGCCCTCCCCATCCAGCACCAGGACTGGATGAGTGGCAAGG AGTTCAAATGCAAGGTCAACAACAAAGACCTCCCAGCGCCCATCGAGAGAACCAT CTCAAAACCCAAAGGGTCAGTAAGAGCTCCACAGGTATATGTCTTGCCTCCACCA GAAGAAGAGATGACTAAGAAACAGGTCACTCTGACCTGCATGGTCACAGACTTCA TGCCTGAAGACATTTACGTGGAGTGGACCAACAACGGGAAAACAGAGCTAAACTA CAAGAACACTGAACCAGTCCTGGACTCTGATGGTTCTTACTTCATGTACAGCAAG  $\tt CTGAGAGTGGAAAGAAGAACTGGGTGGAAAGAAATAGCTACTCCTGTTCAGTGG$ TCCACGAGGGTCTGCACAATCACCACACGACTAAGAGCTTCTCCCGGACTCCGGG TAAATGAG

(SEQ ID NO: 27)